HOME OFFICE

CIVIL DEFENCE

THE ATOM BOMB ITS EFFECTS & HOW TO MEET THEM

PART 3

"RADIATION"

FILM STRIP C.D. 33

LECTURE NOTES

LONDON : HER MAJESTY'S STATIONERY OFFICE
1953

FILM STRIP CD 33

THE ATOM BOMB - ITS EFFECTS AND HOW TO MEET THEM

PART III

RADIATION

FRAME

1 One of the three effects of an Atomic Bomb burst is that of Nuclear Radiation and this effect is itself divided into Immediate Radiation and Residual Radiation. The radiations emitted by the bomb at the moment of detonation come into the first immediate category. The most important of these are Gamma Rays and Neutrons. The lethal range of the neutron is less than that of gamma rays.

2 Gamma rays are used medically for destroying tumours and other growths, they are, of course, carefully controlled to a very fine degree both in intensity and area irradiated.

3 When an Atomic bomb is detonated, gamma rays are emitted in all directions at a very high speed.

4 These rays have the power of penetrating the body causing death or injury of varying degree depending on the dose received.

5 The gamma ray dose received by human beings is governed by two factors, distance from the explosion and amount of protection available.

6 As the rays stream out, their density falls off very rapidly but at $\frac{3}{4}$ mile there is a 50/50 chance of survival in the open.

7 At distances greater than $\frac{3}{4}$ mile the energy and penetrating power fall off rapidly, and at a $1\frac{1}{2}$ mile they are virtually harmless.

8 The second factor is Protectio... For protection from gamma rays the denser the material the less the thickness required.

FRAME

9 At $\frac{1}{4}$ mile from ground zero protection from a lethal dose may be obtained from 7 inches of steel.

10 The same degree of protection can be obtained with two feet of concrete.

11 Three feet of well packed earth will give the same protection as the steel or concrete.

12 Anderson Shelters of the last war will afford definite protection depending on their distance from the explosion. With an additional covering of earth or concrete, they can be efficient to a substantial degree.

13 Into an area some $\frac{1}{4}$ mile radius from ground zero may fall a quantity of particles called fission products. They are radioactive and emit gamma rays (Residual radiation).

14 The rising cloud following the explosion is also filled with these particles; they may be carried by the wind, and will be widely dispersed; some will fall to earth down wind. This is called "The Fallout" (Residual radiation).

15 Neutrons, which are emitted at the same time as the gamma rays, also contribute to the residual radiation, and a number of neutrons will reach the ground in the vicinity of the explosion, where they make certain materials radioactive.

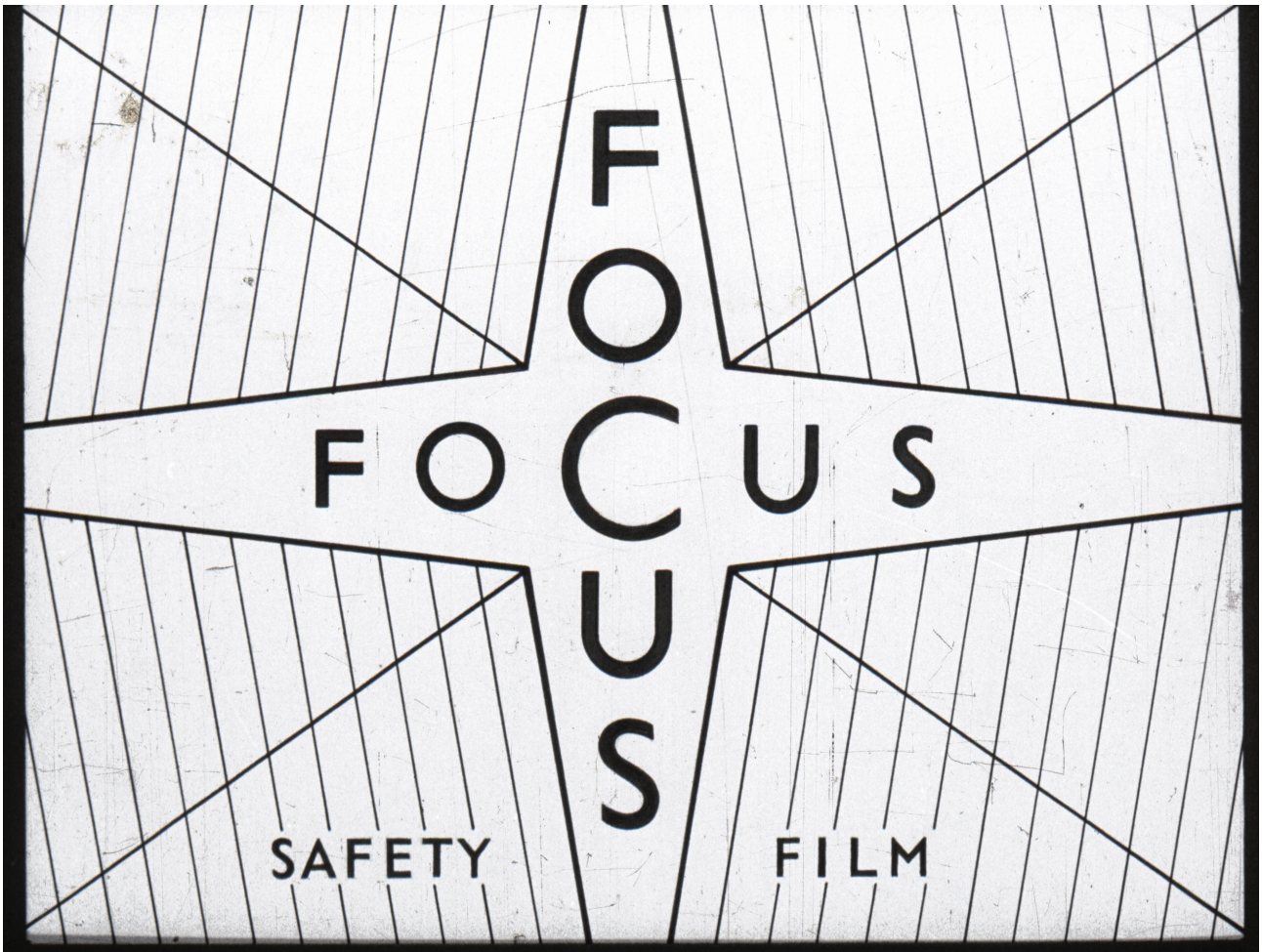
Except in air bursts of about 500 ft. or below, the potential danger from this so called induced radiation is not likely to be serious, in comparison with the dangers from the fission products.

FRAME

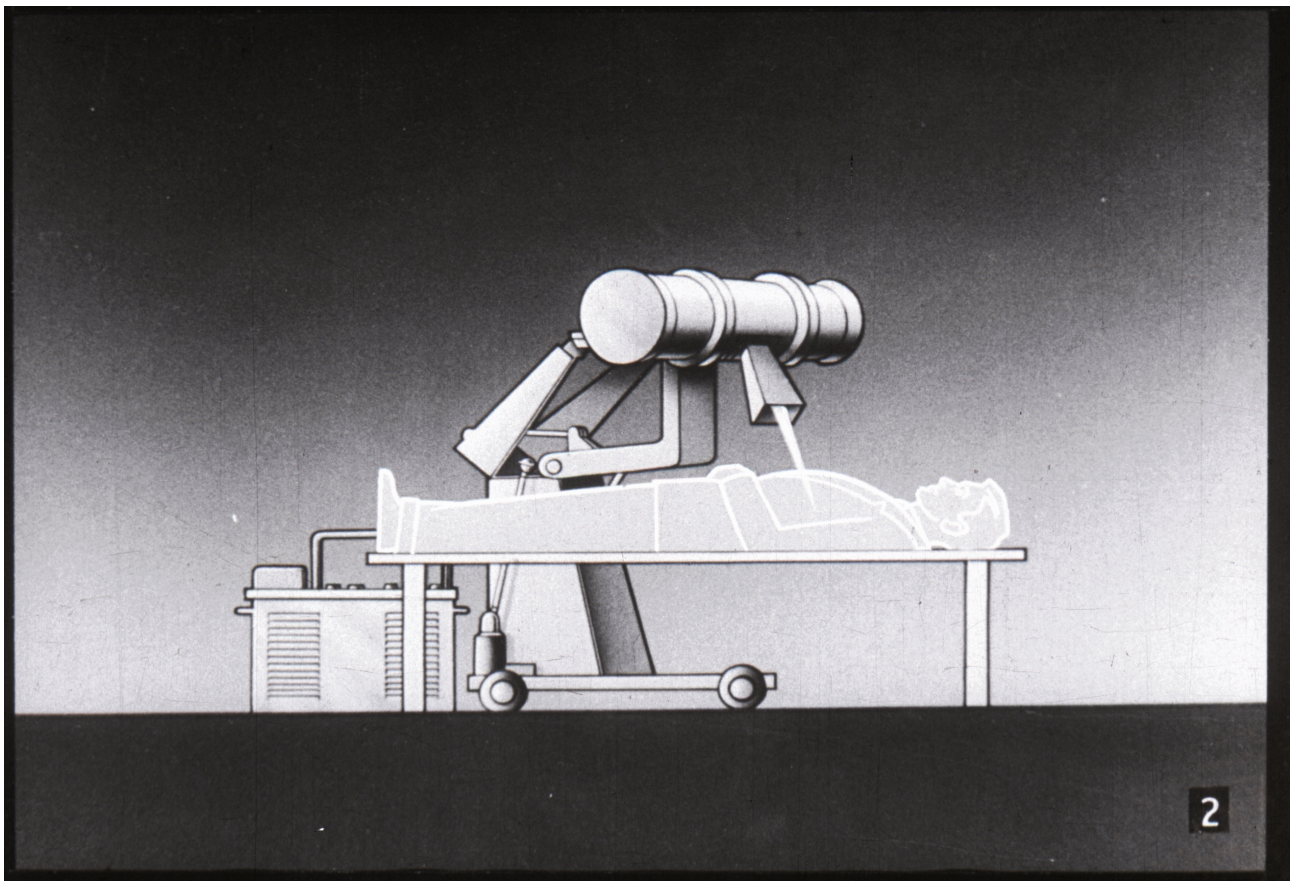
16 Here we have a type of dose rate meter used by a reconnaissance party investigating the hazards due to residual radiation. Radioactive rays are measured in dose rates of Roentgens per hour.

17 It is possible for the radioactive dust of fission products to contaminate exposed food and water.

18 Provided the C.D. worker is adequately protected from gamma rays at the time of the explosion and an accurate record is kept of the dosage received, radiation is the least dangerous of the atom bomb's three effects.


FOCUS
FOCUS
SAFETY
FILM

HOME
OFFICE
OFFICIAL



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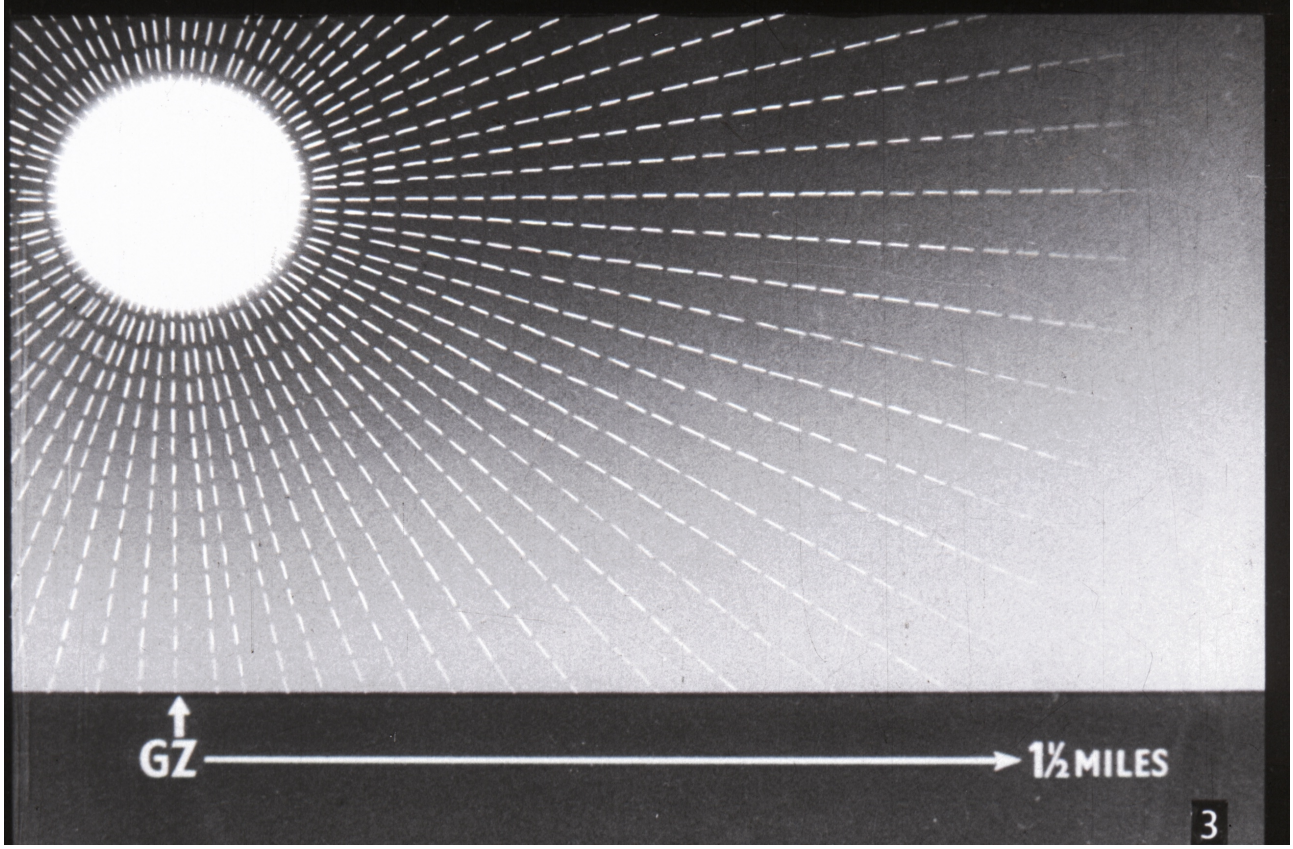

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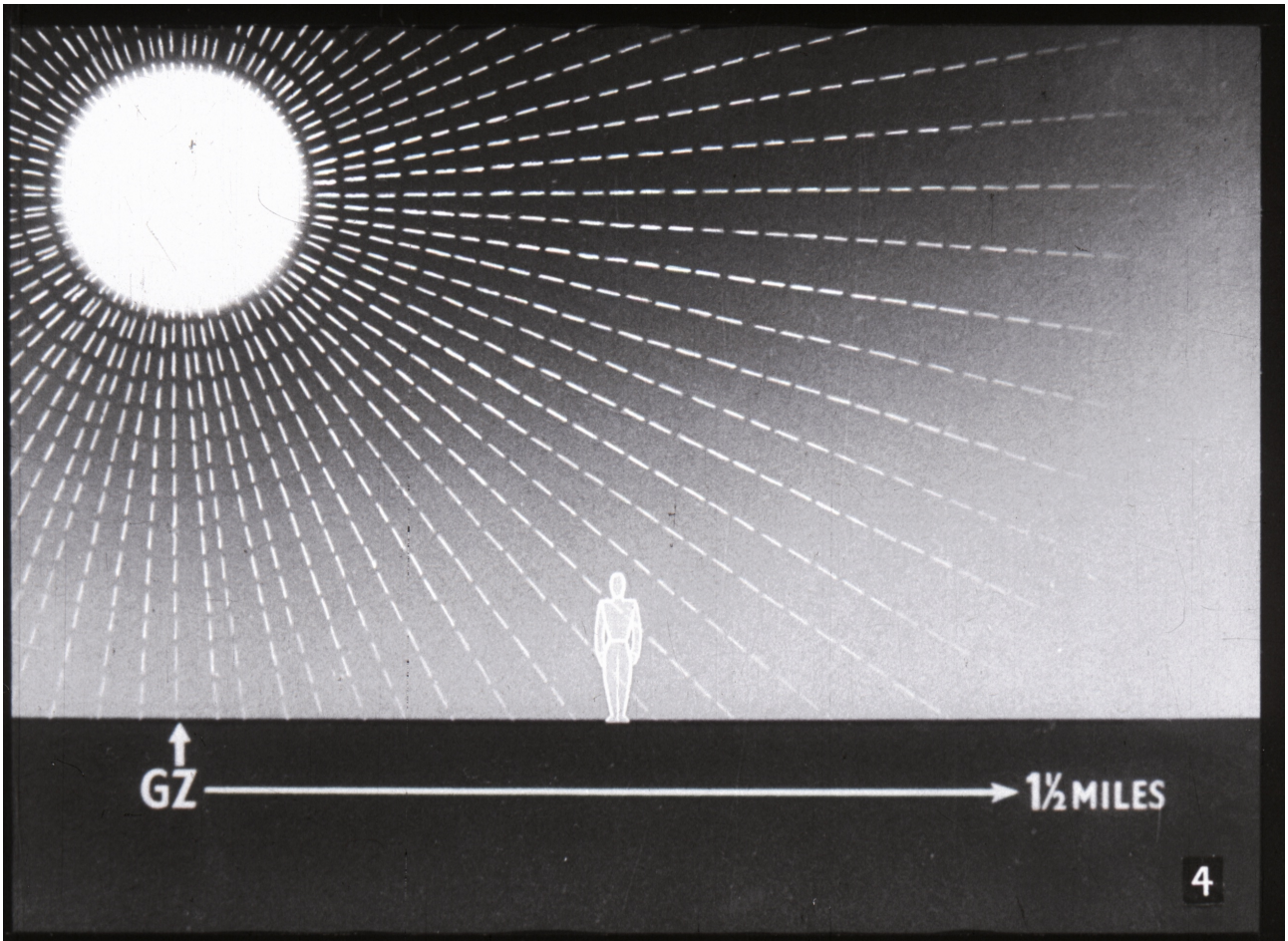
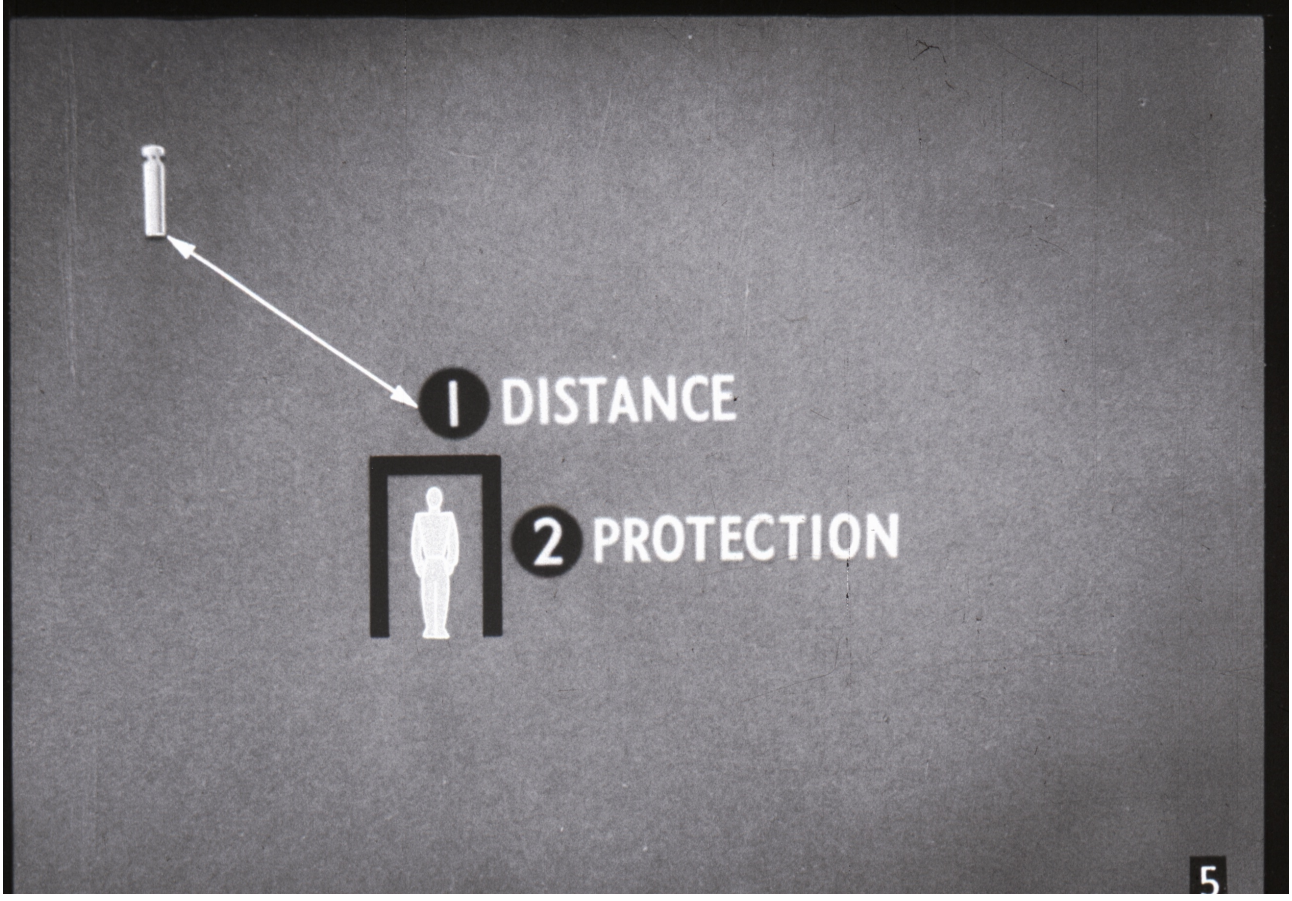
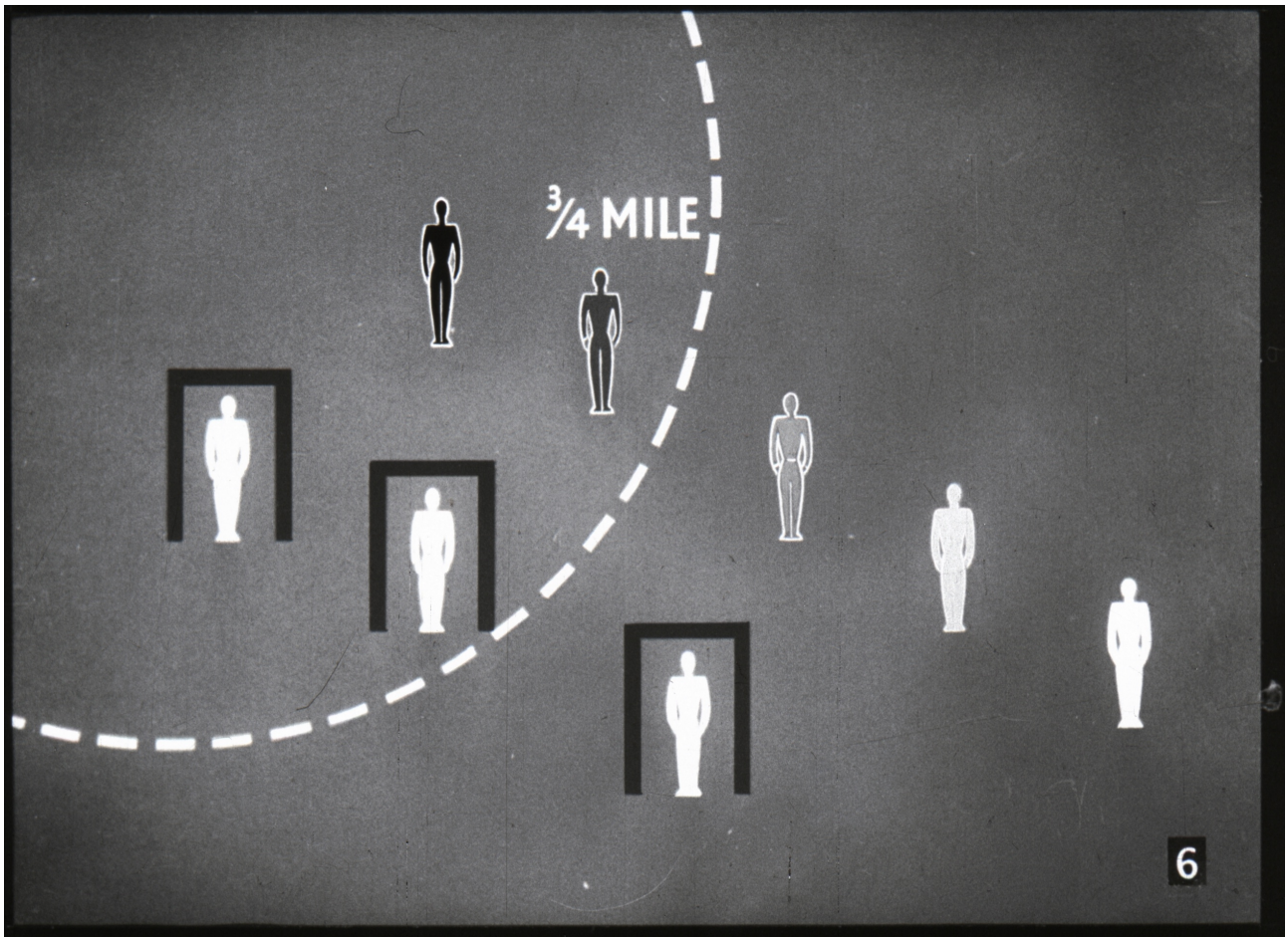
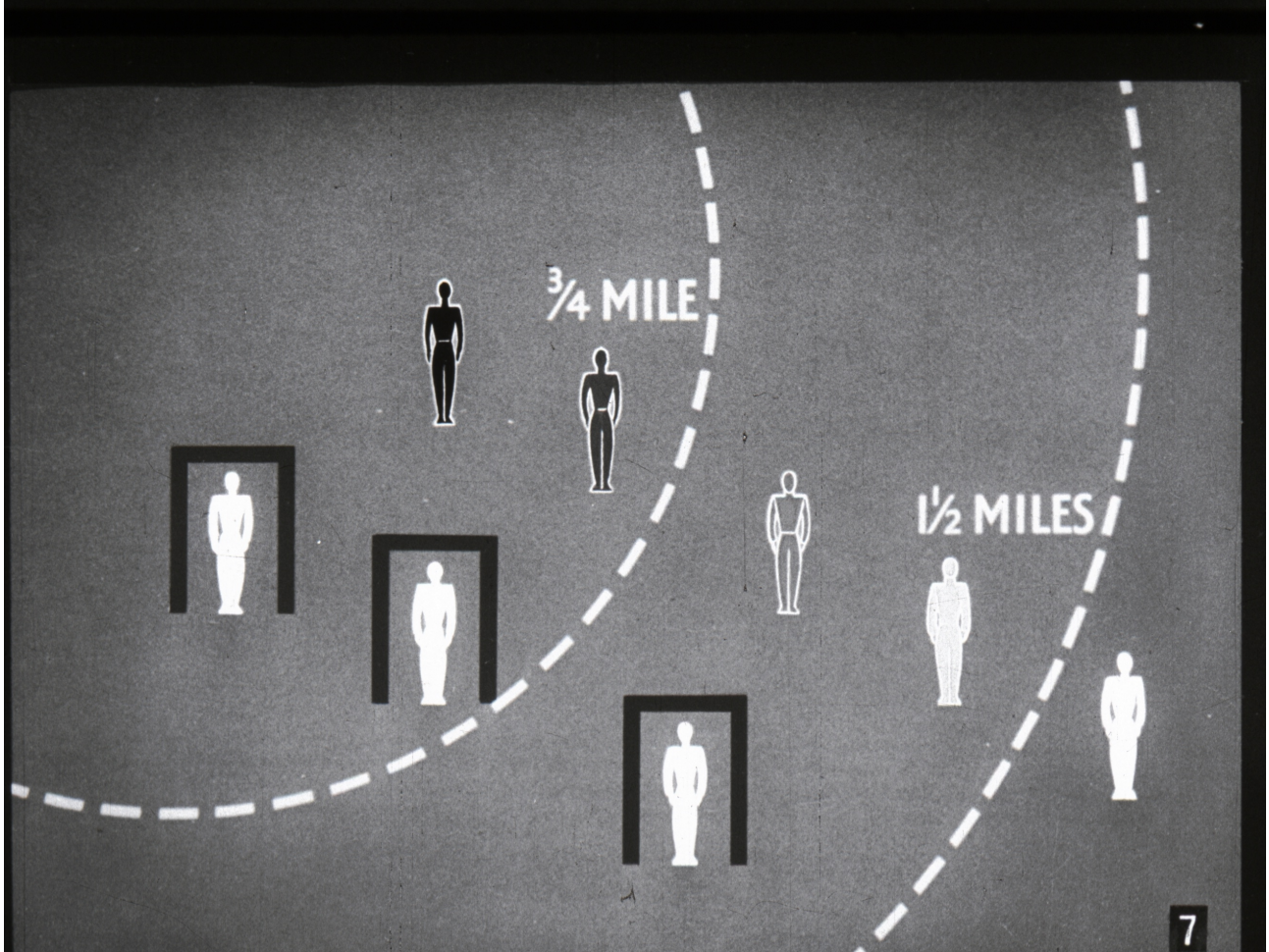
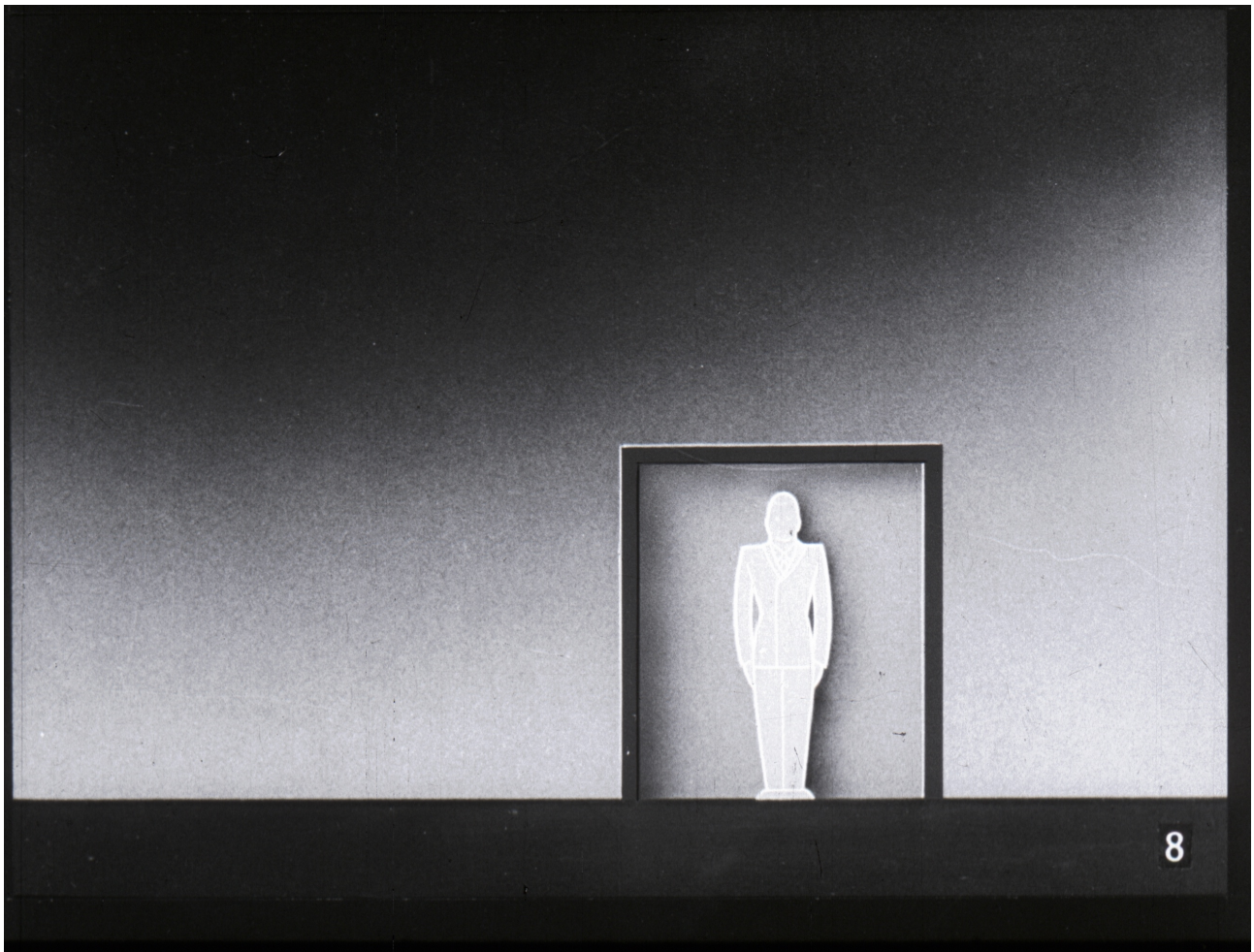

GZ
1½ MILES
4


1 DISTANCE
2 PROTECTION
5


¾ MILE
6


¾ MILE
1½ MILES
7



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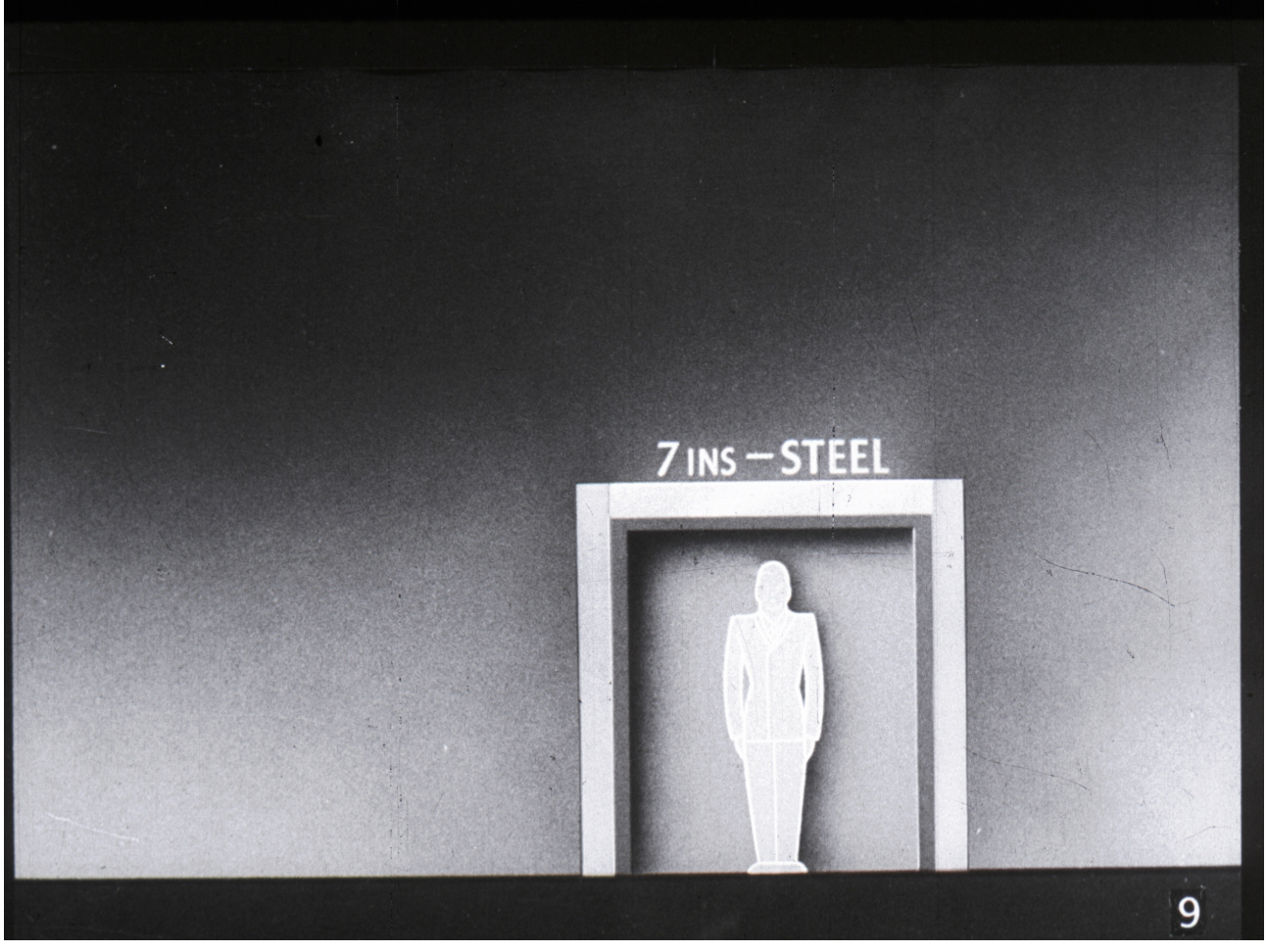

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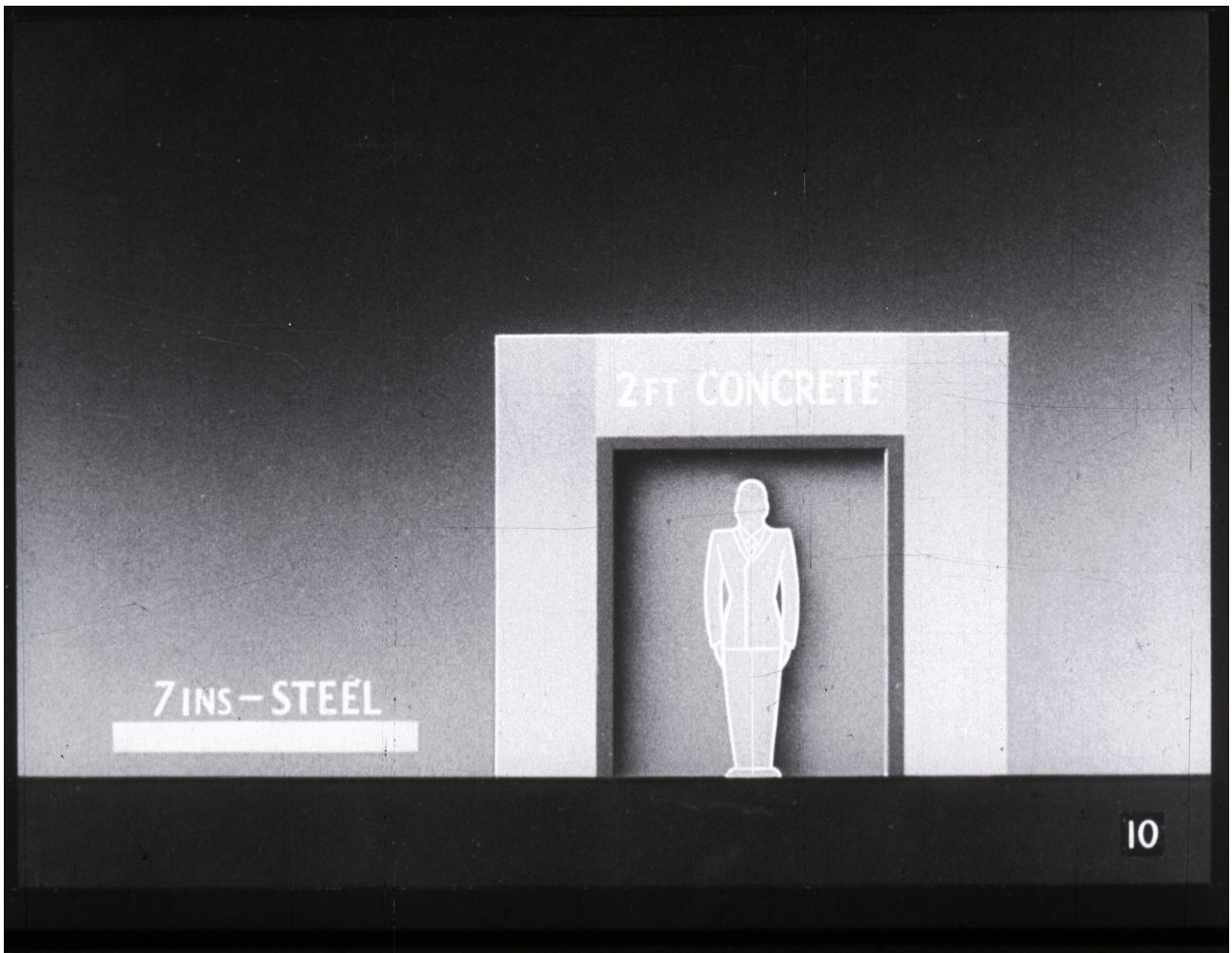
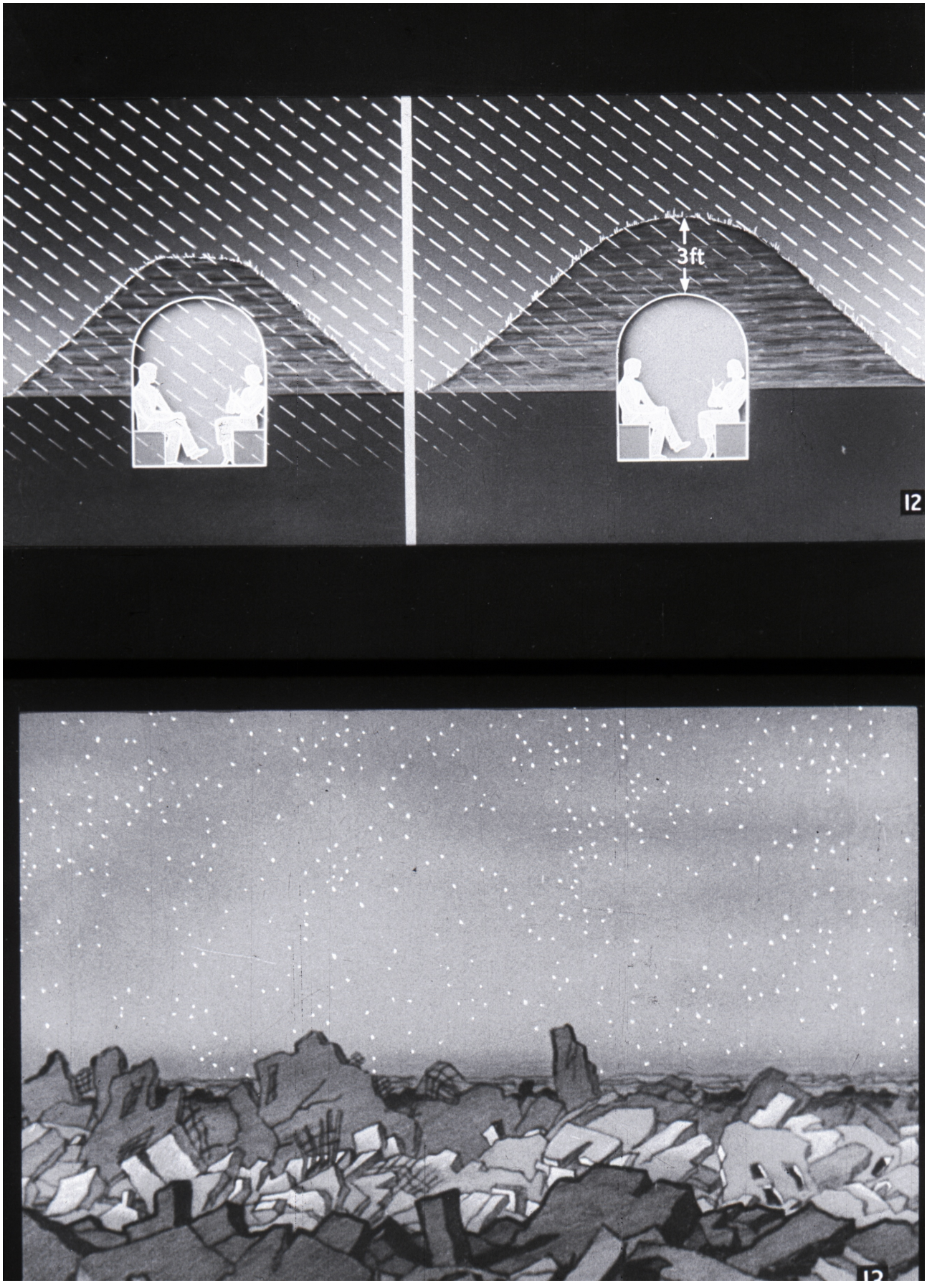
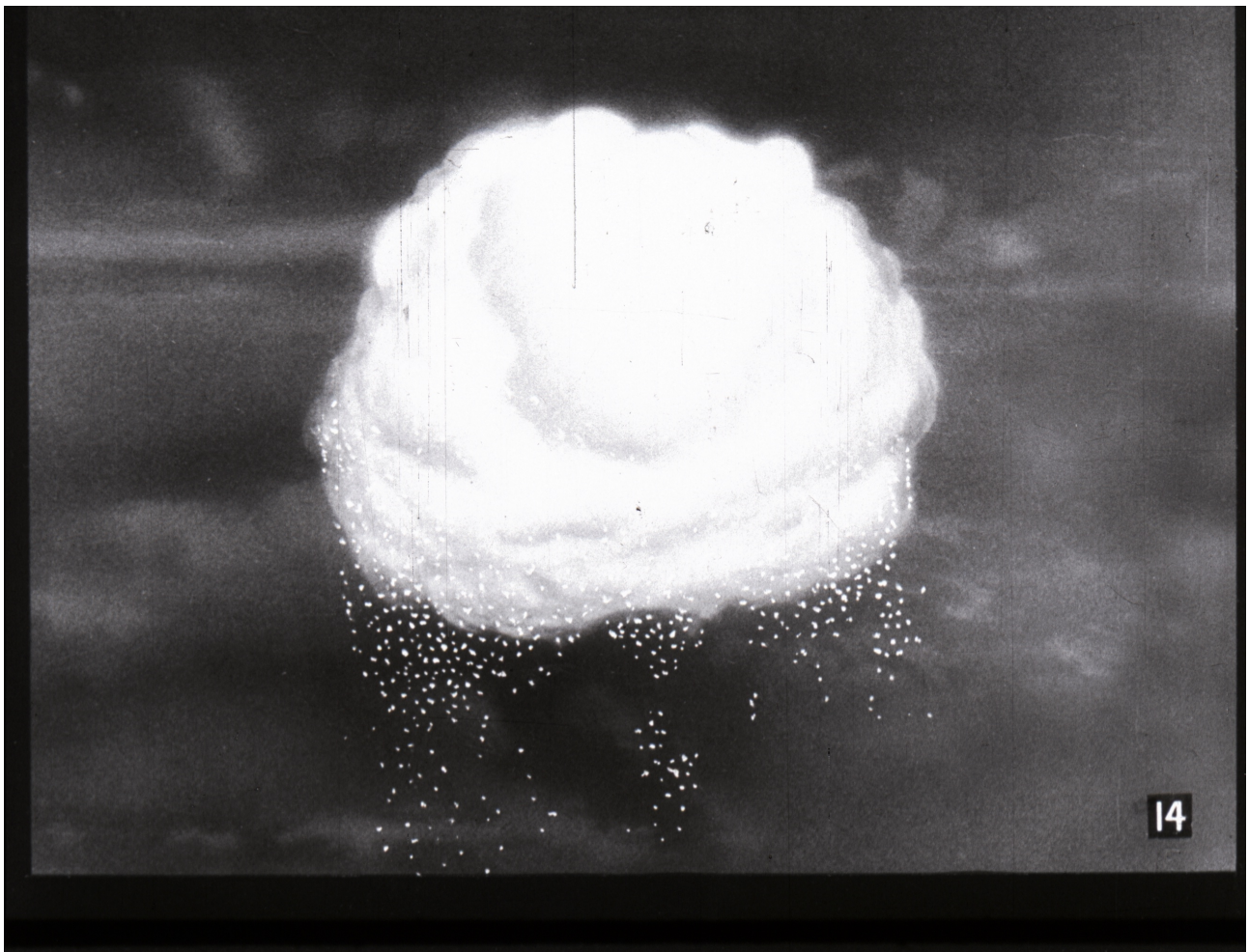

2 FT CONCRETE
7 INS – STEEL
10

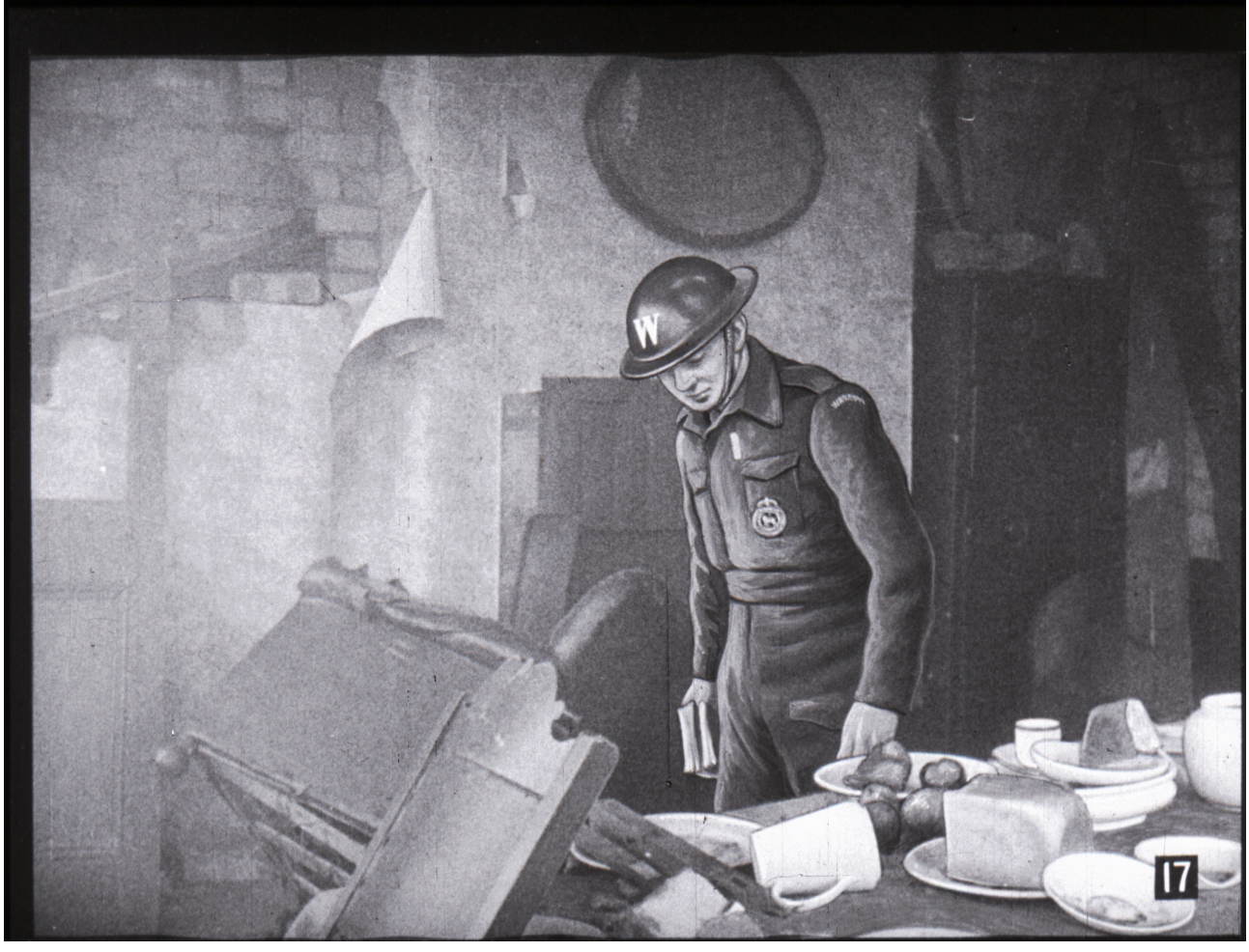
3 FT – EARTH
2 FT CONCRETE
7 INS – STEEL
11


3ft
12
12


14

15

16



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THE END

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